ASTROPHYSICS AND SPACE SCIENCE / *Vols. 269–270 Nos. 1–4 1999*

Special Issue:

# TOWARD A NEW MILLENNIUM IN GALAXY MORPHOLOGY

Proceedings of an International Conference 'Toward a New Millennium in Galaxy Morphology: from $z = 0$ to the Lyman Break' held at the Eskom Conference Centre, Midrand, South Africa, September 13–18, 1999

Guest Editors:
DAVID L. BLOCK, IVÂNIO PUERARI, ALAN STOCKTON and DEWET FERREIRA

A Message from Nelson Mandela ix

Scientific Organising Committee xi

Preface xiii–xx

B. MENDELOW / The Stars and Australopithecus Africanus – Southern Man of Africa 1–2

D.L. BLOCK, I. PUERARI, J.A. FROGEL, P.B. ESKRIDGE, A. STOCKTON and B. FUCHS / Cosmic Masks Still Dance 5–29

J.M. GREENBERG and C. SHEN / Cosmic Dust in the 21st Century 33–55

R. SANCISI / Neutral Hydrogen and Dark Matter in Spiral Galaxies 59–76

R. BUTA / Resonance Rings and Galaxy Morphology 79–99

E. de BLOK, F. WALTER and E. BELL / The Morphology of Nearby Low Surface Brightness Galaxies 101–108

P. GOUDFROOIJ, J. GORGAS and P. JABLONKA / Line Strengths and Line Strength Gradients in Bulges along the Hubble Sequence 109–116

K.C. FREEMAN / On the Origin of the Hubble Sequence 119–137

P.C. van der KRUIT / Properties of the Stellar Velocity Ellipsoid and Stability in Disks of Spiral Galaxies 139–146

D. PFENNIGER / Evolution of Galaxies in the Hubble Sequence 149–162

G. ILLINGWORTH / Galaxies at High Redshift 165–181

M. BERSHADY / Galaxy Form and Spectral Type: a Physical Framework for Measuring Evolution 183–190

Z. HAIMAN / Radiative Feedback from the First Objects and the End of the Cosmological Dark Age 191–199

S.L. ELLISON, M. PETTINI, G.F. LEWIS, A. SONGAILA and L.L. COWIE / Metals in the Ly$\alpha$ Forest 201–208

A. STOCKTON / Deep Galaxy Surveys in the 9150 Å Airglow Window 209–216

G. MILEY / Probing the Early Universe with Radio Galaxies 219–232

B. ROCCA-VOLMERANGE and M. FIOC / The Star Formation History as a Function of Type: Constraints from Galaxy Counts 233–239

R. WINDHORST, S. ODEWAHN, C. BURG, S. COHEN and I. WADDINGTON / Young and Old Galaxies at High Redshift as seen by HST 243–262

G. LAGACHE, J-L PUGET and R. GISPERT / The Submillimeter Extragalactic Background and its Implication for the Star Formation History of the Universe 263–266

F.D. MACCHETTO / Supermassive Black Holes and Galaxy Morphology 269–291

J.C. HOWK / Extraplanar Dust in Spiral Galaxies: Observations and Implications 293–300

C.J. CESARSKY and M. SAUVAGE / A Mid and Far Infrared View of Galaxies 303–319

R.G. ABRAHAM / Quantifying Morphological Evolution from Low to High Redshifts 323–338

M. TAKAMIYA / Morphological Evolution of Galaxies 339–343

S. GOTTLÖBER, A. KLYPIN and A.V. KRAVTSOV / Merging Rate of Dark Matter Halos: Evolution and Dependence on Environment 345–348

I.F. MIRABEL and O. LAURENT / ISO Images of Starbursts and Active Galaxies 349–355

O. LAURENT, I.F. MIRABEL, V. CHARMANDARIS, P. GALLAIS, M. SAUVAGE, L. VIGROUX and C. CESARSKY / Nearby Active and Starburst Galaxies as seen with ISOCAM 357–364

N. SCOVILLE / Ultra-Luminous IR Galaxies at Low and High Redshift 367–379

D.B. SANDERS / A New View of Galaxy Evolution from Submillimeter Surveys with SCUBA 381–389

M. THORNLEY, M. REGAN, T. HELFER, K. SHETH, S. VOGEL, A. HARRIS T. WONG, L. BLITZ and D. BOCK / The Role of Molecular Gas in Galaxy Evolution: Insights from BIMA SONG 391–398

E. STURM, R. GENZEL, D. LUTZ, D. RIGOPOULOU, D. TRAN, H. DANNERBAUER, A.F.M. MOORWOOD and H.W.W. SPOON / Morphology and Evolution of Ultraluminous IR Galaxies – Testing the Merger–QSO Scenario 399–402

F. COMBES / Gas and Dust in Protogalaxies 405–421

P.J. GROSBØL, D.L. BLOCK and P.A. PATSIS / Dust Lanes in Spiral Galaxies 423–426

P.B. ESKRIDGE and J.A. FROGEL / What is the True Fraction of Barred Spiral Galaxies? 427–430

M.E. KAISER, L.D. BRADLEY II, J.B. HUTCHINGS, D.M. CRENSHAW, S.B. KRAEMER, J. RUIZ, T.R. GULL, C. NELSON and D. WEISTROP / Kinematics and Morphology of the Resolved Narrow Line Region in NGC4151 431–434

T.K. MENON / The Role of Morphology in the Generation of Activity in the Nuclei of Galaxies in Compact Groups 435–438

Y-H. CHU / Morphology and Physical Structure of the Interstellar Medium 441–458

A. VOGLER and W. PIETSCH / The Million-Degree Interstellar Medium in Spiral Galaxies 459–466

B.G. ELMEGREEN / The Specific Frequency of Globular Clusters in Galaxies 469–484

G. ILLINGWORTH, D. KELSON, P. van DOKKUM and M. FRANX / Formation and Evolution of E and S0 Galaxies from HST and Keck Studies of $z \sim 0.3 - 1$ Clusters 485–492

R.I. THOMPSON / Star Formation in the NICMOS HDF 493–499

T.G. HAWARDEN, S.D. RYDER, R.J. MASSEY, G.S. WRIGHT and M. TAKAMIYA / A Near-IR Spectral Atlas of IR-Selected Nearby Spirals 501–504

J.K. KOTILAINEN, S. LAINE and S.D. RYDER / Near-Infrared Line Imaging of Circumnuclear Star Formation in Nearby Active Galaxies 505–509

M. STEINMETZ / Numerical Simulations of Galaxy Formation 513–532

R.L. BROWN / Imaging the Gas Distribution and Kinematics in the Early Universe with ALMA 533–540

G.G. FAZIO, P. EISENHARDT and J.-S. HUANG / The Space Infrared Facility (SIRTF): A New Probe for Study of the Birth and Evolution of Galaxies in the Early Universe 541–548

D.A.H. BUCKLEY / The Southern African Large Telescope (SALT) and the potential for galactic dynamical studies 549–555

L.I. GURVITS, R.A. PRESTON and H. HIRABAYASHI / Space VLBI as a Tool for Studying the Early Universe: First Results and Prospects 557–562

D. LEISAWITZ, J.C. MATHER, S.H. MOSELEY Jr. and X. ZHANG / The Submillimeter Probe of the Evolution of Cosmic Structure (SPECS) 563–567

R.S. de JONG and C. LACEY / The Space Density of Spiral Galaxies as a Function of their Scale Size, Surface Brightness and Luminosity 569–576

Z. FREI / Automatic Morphological Classification of Galaxies 577–583

C.J. CONSELICE / Physical Morphology of Galaxies using Asymmetry 585–588

H. SALO and E. LAURIKAINEN / Inner Structure of M 51 589–592

Y. SOFUE / Dark-Matter Distribution Inferred from High-Accuracy Rotation Curves 593–596

S. DEGUCHI and THE SiO MASER SURVEY TEAM / Stellar Velocity Field in the Galactic Bar 597–603

J.H. KNAPEN, S. LAINE and M. RELAÑO / Circumnuclear Star-Forming Regions in Barred Galaxies 605–608

R. CHINI, M. ALBRECHT and M. JÜTTE / Evolution and Star Formation of Dwarf Galaxies 609–612

M.J. LEDLOW, F.N. OWEN, W.C. KEEL and V. ANDERSEN / HST Observations of Abell 2125: Radio Emission & the Butcher-Oemler Effect 613–616

W. FREUDLING / Properties of Emission Line Galaxies at $z \approx 1$ to 2 617–620

B. CUNOW / Investigation of Disc Scalelengths of Sb Galaxies 621–624

N. BERGVALL, G. ÖSTLIN, J. MASEGOSA and E. ZACKRISSON / Starburst Dwarfs-Fueling and Morphological Evolution 625–628

C. HORELLOU, R.S. BOOTH and B. KARLSSON / Necessary but not Sufficient Conditions to Trigger Starbursts. CO and HI observations of Optically Selected Interacting Galaxies 629–632

M. BAES and H. DEJONGHE / Dust Effects on Kinematic Models of Ellipticals 633–634

E. BIÉMONT, P. PALMERI and P. QUINET / A New Database of Astrophysical Interest 635–637

A.C. DANKS / The Origin of QSO Mg II λ2796 Lines 639–640

S. DEGUCHI / IRAS Sources in the Direction of the Galactic Bar 641–644

V. DOUBLIER / Sword Play Between Morphology and Dynamics in Blue Compact Dwarf Galaxies 645–646

R. FALOMO, C.M. URRY, R. SCARPA, J.E. PESCE and A. TREVES / The HST Imaging Survey of BL Lac Objects 647–648

Z. FREI / A Catalog of Digital Images of Nearby Galaxies 649–650

I.S. GLASS / Feeding of the Interstellar Medium in the Galactic Bulge 651–652

A.W. GRAHAM and M. PRIETO / On the Light-Profiles of Spiral Galaxy Bulges and the Hubble Sequence for Spirals 653–654

E. MOLINARI / The Cluster Galaxy Luminosity Function 655–656

E. PIGNATELLI and G. FASANO / GASPHOT: A tool for automated surface photometry 657–658

E. POMPEI and I. PÉREZ / Triaxial Bulges in the NIR 659–660

M. PRIETO and A.I. AGUERRI / Correlations between Structural Parameters of Disk Galaxies 661–662

H. SALO and E. LAURIKAINEN / A Multiple Encounter Model of M51 663–664

M. SEMPERE / Two Decoupled Bars in the Spiral Galaxy NGC 3359 665–666

A. TREVES, E. PIAN, E. PALAZZI, F. SCALTRITI, L. TOMMASI and E. PORETTI / Polarization Measurements of BL Lac Objects in the Southern Hemisphere 667–668

A. TREVES, R. SCARPA, C.M. URRY, R FALOMO, G. GIOVANNINI, J.E. PESCE, R. WEBSTER and M. O'DOWD / Gravitational Lens Candidates in the HST Survey of BL Lac Objects 669–670

M.A.W. VERHEIJEN / Rotation Curve Shapes and the Tully-Fisher Relations 671–672

M.A.W. VERHEIJEN and W.J.G. de BLOK / The HSB/LSB Galaxies NGC 2403 and UGC 128 673–674

THE PANELLISTS / Leaving the Dark Ages: Unmasking the Mask 675–690

G.F.R. ELLIS / Before the Beginning: Emerging Questions and Uncertainties 693–720

THE EDITORS / A Philosophical Perspective 721

W.L. CRAIG / The Ultimate Question of Origins: God and the Beginning of the Universe 723–740

G.F.R. ELLIS / A Response to the W. Craig Lecture 741–744

THE EDITORS / Discussion of Papers 747–782

Colour Plate Section 783–811

List of Participants 813–821